Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Mrch 28, 2013

Mr. Daniel T. Barrett, General Manager
Town of Bourne
Integrated Solid Waste Management Department
24 Perry Ave
Buzzards Bay, MA 02532

RE: BOURNE
Transmittal No.: X241484
Application No.: SE-12-011
Class: OP
FMF No.: 39101
AIR QUALITY PLAN APPROVAL

Dear Mr. Barrett:

The Massachusetts Department of Environmental Protection ("MassDEP"), Bureau of Waste Prevention, has reviewed your Major Comprehensive Plan Application ("Application") listed above. This Application concerns the proposed construction and operation of a landfill gas to energy facility at the Town of Bourne's landfill facility located at 201 MacArthur Boulevard (Route 28), Bourne, Massachusetts ("Facility"). The Application bears the seal and signature of George S. Lipka, Massachusetts Registered Professional Engineer number 29704.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control," regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-J, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator ("Permittee") must comply in order for the Facility to be operated in compliance with this Plan Approval.

1. DESCRIPTION OF FACILITY AND APPLICATION

The Bourne Landfill includes a 74-acre site-assigned parcel, which houses the landfill operations and support facilities. An adjacent 25-acre parcel is used for recycling and transfer operations. The landfill is currently permitted to receive up to 219,000 tons of solid waste per calendar year. The Landfill is currently equipped with a landfill gas (LFG) collection system, which directs the LFG to a scrubbing system then to an existing 36 million Btu per hour (MMBtu/hr) open flare, which is subject to the terms and conditions of the revised MassDEP Approval 4I00014 dated August 24, 2010. All provisions contained in MassDEP Approval 4I00014 remain valid except provision C.2., limiting the annual heat input to the flare and provision D.5., limiting the monthly and annual emissions from the flare, which are superseded herein.

The Town of Bourne has proposed the construction and operation of five (5) Caterpillar SITA Model 3516, or equivalent, engine/electric generator sets that will burn LFG. Each engine / generator set has a maximum rated output of 900 kilowatts (kW) of electricity. Additionally, the Town of Bourne has proposed the installation of one new 60.7 MMBtu/hr open flare.

Exhaust from the five engines can be directed to two (2) leachate evaporators for use as required.

The existing hydrogen sulfide (H_2S) pretreatment system will be utilized to reduce H_2S in the LFG to 200 parts per million by volume (ppmv) prior to combustion in the LFG flare and/or engine / generator sets. The pretreatment system consists of a 3-chamber scrubber, packed with film fill media, a sodium hydroxide metering pump controlled by pH instrumentation, and a bleach metering pump controlled by the ORP instrumentation.

Issuance of this Plan Approval will make the Bourne Landfill a "major" source of emissions for carbon monoxide (CO) because allowable CO emissions will exceed 100 tons per year. As a major source, the Bourne Landfill is subject to the Operating Permit Requirements of 310 CMR 7.00, Appendix C. Pursuant to 310 CMR 7.00 Appendix C(4)(a)(6), the Permittee is required to submit an Operating Permit application no later than one year after the commencement of operation of the portion of the Facility which makes the Facility subject to the program.

The Application indicates that the LFG engines are subject to the New Source Performance Standards (NSPS) as contained in the United States Environmental Protection Agency (USEPA) regulations 40 CFR 60, Subpart JJJJ "Standards of Performance for Stationary Spark Ignition internal combustion Engines." For LFG Engines manufactured after July 1, 2010, the applicable emission requirements for NOx are 2.0 grams per brake horsepower hour (gm/bhp-hr), for CO are 5.0 gm/bhp-hr, and for Volatile Organic Compounds (VOCs) are1.0 gm/bhp-hr. Subpart JJJJ also has various testing, monitoring, recordkeeping, and reporting requirements.

The application indicates that the LFG engines are subject to the National Emission Standards for Hazardous Air Pollutants (NESHAPS) as contained in 40 CFR 63, Subpart ZZZZ "National

Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines."

The application indicates the Bourne Landfill is an affected facility under USEPA regulations 40 CFR 60, Subpart WWW "Standards of Performance for municipal Solid Waste landfills." Subpart WWW applies to each municipal solid waste landfill that commenced construction, reconstruction or modification on or after May 30, 1991. There are several tiers of requirements under Subpart WWW depending on the landfill design capacity and the annual NMOC emissions. Key size thresholds under Subpart WWW are a landfill design capacity of 2.5 million megagrams (2.75 million tons) and 2.5 million cubic meters. For landfills that do not meet both thresholds, the only substantive requirement under Subpart WWW is documenting the landfill design capacity. The application states that Bourne has reviewed the landfill with respect to both size thresholds (2.5 million megagrams (2.75 million tons) and 2.5 million cubic meters), and the landfill remains less than 2.5 million megagrams (2.75 million tons) in capacity with respect to actual quantities of solid waste. Therefore, the only Subpart WWW requirement that currently applies is the documentation of landfill capacity.

MassDEP has accepted delegation of NSPS Subpart JJJJ, NSPS Subpart WWW, and NESHAPS Subpart ZZZZ for facilities designated as "Major." Since Bourne Landfill is a major source subject to 310 CMR 7.00 Appendix C, MassDEP has jurisdiction over said subparts.

The Permittee has demonstrated that the project's ambient air impacts, combined with the pre-existing background levels, will comply with the federal National Ambient Air Quality Standards that are designed to protect the public's health against health effects of air pollutants with a margin of safety.

MassDEP would like to remind you that it is the Town of Bourne's responsibility to comply with the Massachusetts Solid Waste Management Regulations as contained 310 CMR 19.000 and the Site Assignment for Solid Waste Facilities Regulations as contained in 310 CMR 16.000. This includes obtaining any permits required therein. For further guidance on solid waste issues, please contact Mr. Mark Dakers of this office at (508) 946-2847.

The application proposed, and MassDEP concurred that Best Available Control Technology (BACT) is as follows:

- The NOx BACT for the engines was proposed in accordance with MassDEP Policy COM-96.001 "Policy Relating to the Permitting of Landfill Gas-to-Energy Projects," which allows an emission rate of 0.60 grams per brake horsepower-hour (gm/bhp-hr) as presumptive BACT for LFG engines when combined with a NOx / CO optimization / minimization program.

  BACT for the open flare will continue to be the previous "top-case" determination for NOx.

- The CO BACT emission limit for the engines is proposed as 3.0 gm/bhp-hr, which is equivalent to 0.771 pounds per million British thermal units (lb /MMBtu), is more stringent

then recent LFG approvals issued by MassDEP for the same engine model. Oxidizing Catalysts were found to be technically infeasible due to their intolerance to any contaminants or impurities, principally siloxanes, in the exhaust gas. The Permittee could not identify any engine or catalyst vendors who are willing to guarantee oxidation catalysts for combusting LFG.

BACT for the open flare will continue to be the previous top-case determinations for CO.

- Sulfur Dioxide (SO_2) BACT is based on the LFG limit of 200 ppmv for H_2S that was established by MassDEP Approval 4I00014 (issued to Bourne Landfill on May 23, 2000 and revised on August 24, 2010) for the proposed engines and flare.
- Particulate Matter ($PM/PM_{10}/PM_{2.5}$) BACT will be achieved by installing LFG pretreatment for moisture removal and particulate filtration to minimize LFG contaminants prior to introduction into the proposed engines or flare. The leachate evaporators will include high efficiency entrainment separators to control PM emissions.
- VOC BACT, as proposed, is equivalent to top-case for VOC, which is achieved by good operational practices.

  VOC BACT for the open flare was based on a cost effectiveness demonstration provided by the Permittee demonstrating that use of an ultra-low emissions flare was not cost effective for this application. BACT for the flare is 0.032 lb/MMBtu, which continues to be the same as approved for the previous open flare in MassDEP Approval 4I00014 (issued to Bourne Landfill on May 23, 2000 and revised on August 24, 2010).

This Plan Approval was subject to a public comment period as specified in the Commonwealth's Air Pollution Control Regulations 310 CMR 7.02(3)(h) "Opportunity for Comment." A Public Notice was published in the Cape Cod Times on January 18, 2013, the commencement date of the mandatory thirty (30) day public comment period. No comments were received.

During the public comment period, MassDEP realized that the Facility's status relative to NSPS Subpart WWW "Standards of Performance for Municipal Solid Waste Landfills" was not explicitly identified. A paragraph identifying the Facility's status relative to Subpart WWW has been added to Section 1 of this Plan Approval. Additionally, MassDEP has clarified the language regarding the delegation of Federal Regulations.

2. EMISSION UNIT (EU) IDENTIFICATION

Each Emission Unit (EU) identified in Table 1 is subject to and regulated by this Plan Approval:

Table 1			
EU#	**Description**	**Design Capacity**	**Pollution Control Device (PCD)**
EU1	Caterpillar Model 3516 LFG Engine or equivalent	900 kW 10.84 MMBtu/hr (HHV) 1,264 bhp	1. Hydrogen sulfide scrubber 2. LFG PM filter 3. Silex JB-25-30 muffler
EU2	Caterpillar Model 3516 LFG Engine or equivalent	900 kW 10.84 MMBtu/hr (HHV) 1,264 bhp	1. Hydrogen sulfide scrubber 2. LFG PM filter 3. Silex JB-25-30 muffler
EU3	Caterpillar Model 3516 LFG Engine or equivalent	900 kW 10.84 MMBtu/hr (HHV) 1,264 bhp	1. Hydrogen sulfide scrubber 2. LFG PM filter 3. Silex JB-25-30 muffler
EU4	Caterpillar Model 3516 LFG Engine or equivalent	900 kW 10.84 MMBtu/hr (HHV) 1,264 bhp	1. Hydrogen sulfide scrubber 2. LFG PM filter 3. Silex JB-25-30 muffler
EU5	Caterpillar Model 3516 LFG Engine or equivalent	900 kW 10.84 MMBtu/hr (HHV) 1,264 bhp	1. Hydrogen sulfide scrubber 2. LFG PM filter 3. Silex JB-25-30 muffler
F1 *	Parnell Biogas Open Flare	36.0 MMBtu/hr (HHV)	None
F2	John Zink Model ZEF 1030 or equivalent Open flare	60.7 MMBtu/hr (HHV)	None
EVAP-1	Heartland Technologies Leachate Evaporator or equivalent	exhaust from engines E1, E2, E3	Entrainment separators (PM removal)
EVAP-2	Heartland Technologies Leachate Evaporator or equivalent	exhaust from engines E4, E5	Entrainment separators (PM removal)

* Unit F1 was approved by Conditional Approval 4I00014, transmittal W010477, revised on August 24, 2010.

Table 1 Key:
EU# = Emission Unit Number
bhp = brake horsepower
HHV = higher heating value
kW = kilowatt
LFG = landfill gas
MMBtu/hr = million British thermal units per hour
PCD = Pollution Control Device
PM – particulate matter

3. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2 below:

Table 2				
EU#	**Operational / Production Limit**	**Air Contaminant**	**Emission Limit**	
EU1-EU5		$PM / PM_{10} / PM_{2.5}$	0.051 lb/MMBtu 0.20 gm/bhp-hr	Per EU
			1.04 TPM 12.2 TPY	EU total
		NOx	0.154 lb/MMBtu 0.60 gm/bhp-hr	Per EU
			3.11 TPM 36.6 TPY	EU total
		CO	0.771 lb/MMBtu 3.0 gm/bhp-hr	Per EU
			15.5 TPM 183 TPY	EU total
		VOC	0.077 lb/MMBtu 0.30 gm/bhp-hr	Per EU
			1.55 TPM 18.3 TPY	EU total
		NMOC	98% reduction (wgt) ***or*** less than 20 ppmv (as hexane, dry basis at 3% O_2 or less) 0.077 lb/MMBtu 0.30 gm/bhp-hr	Per EU
			1.55 TPM 18.3 TPY	EU total
	1. $H_2S \leq 200$ ppmv (contained in LFG)	SO_2	0.066 lb/MMBtu 0.26 gm/bhp-hr	Per EU
			1.33 TPM 15.7 TPY	EU total
		single HAP	0.016 lb/MMBtu 0.06 gm/bhp-hr	Per EU
			0.32 TPM 3.8 TPY	EU total
		total HAP	0.024 lb/MMBtu 0.09 gm/bhp-hr	Per EU
			0.48 TPM 5.7 TPY	EU total
		CO_{2e}	2,877 lb/MWhr	Per EU

Table 2				
EU#	**Operational / Production Limit**	**Air Contaminant**	**Emission Limit**	
		Visible Emissions	0% opacity exclusive of uncombined water vapor, with the exception of up to five (5) minutes during startup. During startup visible emissions shall comply with the provisions of 310 CMR 7.06.	
F1-F2	2. LFG ≤ 45,161 MMBtu/month 3. LFG ≤ 531,732 MMBtu/yr prior to operation of first LFG engine 4. LFG ≤ 231,659 MMBtu/yr after operation of first LFG engine commences. 5. 300 °F minimum temperature to document presence of a flame	$PM / PM_{10} / PM_{2.5}$	0.046 lb/MMBtu	Per EU
			1.04 TPM 5.3 TPY	EU total
		NOx	0.055 lb/MMBtu	Per EU
			1.24 TPM 6.4 TPY	EU total
		CO	0.273 lb/MMBtu	Per EU
			6.16 TPM 31.6 TPY	EU total
		VOC	0.032 lb/MMBtu	Per EU
			0.72 TPM 3.7 TPY	EU total
		NMOC	98% reduction (wgt) ***or*** less than 20 ppmv (as hexane, dry basis at 3% O_2 or less) 0.04 lb/MMBtu	Per EU
			0.90 TPM 4.6 TPY	EU total
	6. H_2S ≤ 200 ppmv (contained in LFG)	SO_2	0.066 lb/MMBtu	Per EU
			1.49 TPM 7.6 TPY	EU total

Table 2				
EU#	**Operational / Production Limit**	**Air Contaminant**	**Emission Limit**	
		single HAP	0.008 lb/MMBtu	Per EU
			0.18 TPM 0.90 TPY	EU total
		total HAP	0.013 lb/MMBtu	Per EU
			0.29 TPM 1.5 TPY	EU total
		CO_{2e}	215 lb/MMBtu	Per EU
		Visible Emissions	0% opacity except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours. During this period visible emissions shall comply with the provisions of 310 CMR 7.06.	
EVAP1 & EVAP2		$PM / PM_{10} / PM_{2.5}$	0.064 lb/MMBtu 0.25 gm/bhp-hr	Per EU
			1.3 TPM 15.3 TPY	EU total
		VOC	0.080 lb/MMBtu 0.31 gm/bhp-hr	Per EU
			1.62TPM 19.0 TPY	EU total
		total HAP	0.025 lb/MMBtu 0.10 gm/bhp-hr	Per EU
			0.05 TPM 5.9 TPY	EU total

Table 2 Key:
EU# = Emission Unit Number
CO = Carbon Monoxide
CO_{2e} = Carbon Dioxide equivalents
HAP (single) = maximum single Hazardous Air Pollutant
HAPs (total) = total Hazardous Air Pollutants.
H_2S = hydrogen sulfide
NMOC = Non-methane organic compounds
NO_X = Nitrogen Oxides
PM = Total Particulate Matter
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter

$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter
SO_2 = Sulfur Dioxide
VOC = Volatile Organic Compounds
dB(A) = decibels, A weighted average
gm / bhp-hr = grams per brake horsepower hour
lb / MMBtu = pounds per million British thermal units
lb / MWhr = pounds per megawatt hour
LFG = Landfill gas
MMBtu/month = million British thermal units per month
MMBtu/yr = million British Thermal Units per consecutive 12-month period
TPM = tons per month
TPY = tons per consecutive12-month period
wgt = weight

B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5 below:

Table 3

EU#	Monitoring and Testing Requirements
EU1-EU5	1. Total LFG flow to the five (5) engine/generator sets shall be continuously monitored.
	2. Each engine/generator set shall be continuously monitored for run time and kW of electricity produced.
	3. The facility shall be constructed to accommodate the emission testing requirements contained in 40 CFR Part 60 Appendix A.
	4. All compliance emission testing shall be conducted in accordance with MassDEP's "Guideline for Source Emission Testing" and test methods and procedures contained in 40 CFR 60 Appendix A.
	5. A NOx/CO optimization / minimization diagnostic emission test program shall be conducted on each engine prior to compliance demonstration testing.
	6. Emission testing shall be performed on each engine to determine compliance with the CO, VOC and NOx emission limits (ppmv, lb/MMBtu & gm/bhp-hour). All emission testing shall be completed within 180 days from the date that each engine commences LFG burning.
F1-F2	7. Total LFG flow to the flares shall be continuously monitored.
	8. Pilot flame temperature shall be continuously monitored.
	9. 40 CFR 60 Appendix A, Method 22 shall be used to determine compliance with the flare's visible emission limit.

Table 3	
EU#	**Monitoring and Testing Requirements**
EVAP1 & EVAP2	10. The number of hours of operation of each leachate evaporator shall be monitored.
Facility-wide	11. Once per week a gas sample shall be taken at the inlet and outlet of the H2S scrubber and an analysis shall be conducted to determine the H2S concentration (ppmv) in the landfill gas.
	12. The Permittee shall monitor all operations to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	13. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13.

Table 3 Key:
EU# = Emission Unit Number
CO = Carbon Monoxide
H_2S = Hydrogen sulfide
NMOC = non-Methane Hydrocarbon
NOx = Oxides of Nitrogen
VOC = volatile organic compound
SO_2 = Sulfur Dioxide
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
gm/bhp-hour = grams per brake horsepower-hour
lb/MMBtu = pounds per million British thermal units
LFG = Landfill gas
kW = kilowatts
ppmv = parts per million by volume
USEPA = United States Environmental Protection Agency

Table 4	
EU#	**Record Keeping Requirements**
EU1-EU5	1. NOx, CO, NMOC, VOC, PM, SO_2, HAP (single) and HAP (total) monthly and twelve month rolling period emission rate records for each engine shall be maintained.
	2. Total LFG flow to the five (5) engine/generator sets shall be continuously recorded.
	3. Continuously recorded run time and kW of electricity produced for each engine/generator set.

Table 4	
EU#	**Record Keeping Requirements**
	4. A record of the volume of LFG (scf) fired in each engine/generator for each month and for each twelve month consecutive period shall be maintained. This record shall take into account the total volume of LFG fired by the five (5) engine/generator sets and the individual engine/generator set run time and amount of electricity produced.
	5. A record of the heat input of LFG (Btu) fired in each engine/generator set, for each month and for each twelve-month rolling period records shall be maintained. These heat input records may be generated by gas analyzer and/or field measurements.
	6. A copy of the NO_x / CO optimization / minimization program report shall be maintained on-site.
F1-F2	7. NOx, CO, NMOC, VOC, PM, SO_2, HAP (single) and HAPs (total) monthly and twelve month rolling period emission rate records for the flare shall be maintained.
	8. LFG flow to the flares shall be continuously recorded.
	9. Pilot flame temperature for each flare shall be continuously recorded.
	10. A record of the volume of LFG (scf) fired in the flares for each month and for each twelve month consecutive period shall be maintained.
	11. A record of the heat input of LFG (Btu) fired in the flares, for each month and for each twelve-month rolling period records shall be maintained. These heat input records may be generated by gas analyzer and/or field measurements.
EVAP1 & EVAP2	12. The run time for each leachate evaporator shall be recorded, documenting the number of hours operated each month and each consecutive 12-month period.
Facility-wide	13. A record of the LFG H_2S concentration (ppm) at the inlet to the H_2S Pretreatment System and at the inlets to the flare and engines shall be based upon samples taken at least once per week.
	14. The Permittee shall maintain adequate records on-site to demonstrate compliance with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve month period (current month plus prior eleven months). These records shall be compiled no later than the 15th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/dep/air/approvals/aqforms.htm#report .
	15. The Permittee shall maintain records of monitoring and testing as required by Table 3.
	16. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EU(s) approved herein on-site.
	17. The Permittee shall maintain a record of routine maintenance activities performed on the approved EU(s), PCD(s) and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.

Table 4	
EU#	**Record Keeping Requirements**
	18. The Permittee shall maintain a record of all malfunctions affecting air contaminant emission rates on the approved EU(s) and monitoring equipment. At a minimum, the records shall include: date and time the malfunction occurred; description of the malfunction; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation.
	19. The Permittee shall maintain records to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	20. All records and all emission test reports shall be maintained for the life of the facility; the five most recent years of data/records shall be maintained on-site.
	21. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.

Table 4 Key:
EU# = Emission Unit Number
CO = Carbon Monoxide
HAP = Hazardous Air Pollutant
H_2S = Hydrogen Sulfide
NMOC = non-Methane Organic Compounds
NOx = Oxides of Nitrogen
PM = Particulate Matter
SO_2 = Sulfur Dioxide
VOC = Volatile Organic Compounds
Btu = British thermal units
CMR = Code of Massachusetts Regulations
kW = kilowatts
LFG = Landfill gas
PCD = Pollution Control Device
SOMP = Standard Operating and Maintenance Procedure
scf = standard cubic feet
ppmv = parts per million by volume
USEPA = United States Environmental Protection Agency

Table 5	
EU#	**Reporting Requirements**
EU1-EU5	1. Notification shall be made to MassDEP, in writing, within 10 days from the date that each engine commences LFG burning.

Table 5	
EU#	**Reporting Requirements**
	2. Final Standard Operating and Maintenance procedures (SOMP) for Unit Nos. 1 through 5 shall be submitted within 45 days from the completion of stack emission testing referenced in Section B, Table 3. In addition, any subsequent revisions to the Final SOMP shall be submitted to MassDEP within seven (7) days from their initial use.
F2	3. Notification shall be made to MassDEP, in writing, within 10 days from the date that the flare (F2) approved herein commences LFG burning.
Facility-wide	4. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a "Responsible Official" as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	5. The Permittee shall notify the Southeast Regional Office of MassDEP, BWP Permit Chief by telephone (508-946-2824), email (sero.air@state.ma.us) or fax (508-947-6557), as soon as possible, but no later than one (1) business day after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to Permit Chief at MassDEP within three (3) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	6. The Permittee shall report annually to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form. The Permittee shall note therein any minor changes (under 310 CMR 7.02(2)(e), 7.03, 7.26, etc.), which did not require Plan Approval.
	7. The Permittee shall provide a copy to MassDEP of any record required to be maintained by this Plan Approval within 30-days from MassDEP's request.
	8. The Permittee shall submit to MassDEP for approval a stack emission pretest protocol, at least 30 days prior to emission testing, for emission testing as defined in Table 3 Monitoring and Testing Requirements.
	9. The Permittee shall submit to MassDEP a final stack emission test results report, within 45 days after emission testing, for emission testing as defined in Table 3 Monitoring and Testing Requirements.

Table 5 Key:
EU# = Emission Unit Number
LFG = Landfill gas

4. SPECIAL TERMS AND CONDITIONS

The Permittee is subject to, and shall comply with, the following special terms and conditions:

A. The Permittee shall comply with the Special Terms and Conditions as contained in Table 6, below:

Table 6	
EU#	**Special Terms and Conditions**
EU1-EU5	1. The existing hydrogen sulfide pretreatment system shall be utilized to reduce H_2S in the LFG to 200 ppmv or less prior to combustion in each engine/electric generator set.
F1-F2	2. The existing hydrogen sulfide pretreatment system shall be utilized to reduce H_2S in the LFG to 200 ppm or less prior to combustion in the flares.
	3. In addition to flare emission limitations identified in Table 2, prior to the installation of the first engine the Permittee shall limit emissions as follows: $PM / PM_{10} / PM_{2.5} \leq 12.2$ TPY NOx $\leq$ 14.6 TPY CO $\leq$ 72.6 TPY VOC $\leq$ 8.5 TPY SO2 $\leq$ 17.5 TPY NMOC $\leq$ 10.6 TPY Single HAP $\leq$ 2.1 TPY Total HAPs $\leq$ 3.5 TPY
	4. The open flare design shall comply with the requirements of 40 CFR 60.18.
Facility-wide	5. There shall be no direct release or bypass of LFG from the engines or flare to the ambient air.
	6. The hydrogen sulfide (H_2S) scrubber shall be in use at all times other than during short periods of H_2S Pretreatment System downtime for maintenance, not to exceed eight (8) hours, or during an "Emergency" as defined in 310 CMR 7.00 Appendix C(1).
	7. Offsite noise from the operation of the Facility shall not exceed 10 dB(A) above background and shall not cause a puretone condition as defined in MassDEP's DAQC Policy No. 90-001.
	8. Pursuant to 310 CMR 7.00 Appendix C(4)(a)5, an Operating Permit application for the Facility shall be submitted no later than one (1) year after commencement of operation. Commencement of operation is when the first Emission Unit approved herein commences LFG burning.
	9. All instrumentation, monitoring systems and sampling equipment shall be maintained and operated in accordance with the manufacture's recommended procedures.
	10. The Permittee is subject to the terms, conditions and provisions in MassDEP Approval 4I00014 (transmittal W010477) as revised on August 24, 2010 except Provision C.2., limiting the annual heat input to the flare and Provision D.5., limiting the monthly and annual emissions from the flare. All other terms and provisions in Approval 4I00014 remain valid.

Table 6 Key:
EU# = Emission Unit Number
CFR = Code of Federal Regulations

CMR = Code of Massachusetts Regulations
H_2S = Hydrogen Sulfide
CO = Carbon Monoxide
HAP (single) = maximum single Hazardous Air Pollutant
HAPs (total) = total Hazardous Air Pollutants.
H_2S = hydrogen sulfide
NMOC = Non-methane organic compounds
NO_X = Nitrogen Oxides
PM = Total Particulate Matter
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter
SO_2 = Sulfur Dioxide
VOC = Volatile Organic Compounds
dB(A) = decibels, A weighted average
LFG = Landfill gas
ppmv = parts per million by volume
≤ = less than or equal to
TPY = tons per consecutive 12-month period

B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including but not limited to rain protection devices known as "shanty caps" and "egg beaters." The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7 below, for the Emission Units that are regulated by this Plan Approval:

Table 7

EU#	Stack Height Above Ground (feet)	Stack Inside Exit Dimensions (feet)	Stack Gas Exit Velocity Range (feet per second)	Stack Gas Exit Temperature Range (°F)
E1	40	1.5	35.9 – 74.8	735 - 785
E2	40	1.5	35.9 – 74.8	735 - 785
E3	40	1.5	35.9 – 74.8	735 - 785
E4	40	1.5	35.9 – 74.8	735 - 785
E5	40	1.5	35.9 – 74.8	735 - 785
F1 *	25	0.67	65.6	1,832
F2 *	30	0.83	65.6	1,832
EVAP-1	55	1.75	39.3 – 78.6	134
EVAP-2	55	1.5	35.6 – 71.3	134

* Flare stack parameters used for emissions modeling purposes were calculated based on flare Btu firing rate for dispersion modeling using procedures specified in USEPA SCREEN3 model.

Table 7 Key:
EU# = Emission Unit Number
°F = Degree Fahrenheit
Btu = British thermal unit

5. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).

B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.

C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.

D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.

F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.

G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.

H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.

I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.

J. The Permittee shall conduct emission testing, if requested by MassDEP, in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13. If required, a pretest protocol report shall be submitted to MassDEP at least 30 days prior to emission testing and the final test results report shall be submitted within 45 days after emission testing.

K. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

6. MASSACHUSETTS ENVIRONMENAL POLICY ACT

The Permittee submitted an Environmental Notification Form (ENF) to the Massachusetts Environmental Policy Act (MEPA) Unit on September 24, 1997 for the continued landfill operations beyond the Phase 2 lined landfill. The project (EEA No. 11333) was noticed in the Environmental Monitor on October 7, 1997. The Secretary of Energy and Environmental Affairs issued a Certificate on the ENF on December 31, 1997. The Secretary determined that the project required a Draft Environmental Impact Report (DEIR) and provided the scope of the DEIR.

The Permittee submitted a DEIR for the project to the MEPA Unit on December 3, 1998. The DEIR was noticed in the Environmental Monitor on December 23, 1998. The Secretary of Energy and Environmental Affairs issued a Certificate on the DEIR on February 16, 1999.

The Permittee submitted a Final Environmental Impact Report (FEIR) for the project to the MEPA Unit on October, 1999. The FEIR was noticed in the Environmental Monitor on October 23, 1999. On November 29, 1999, the Secretary of Energy and Environmental Affairs issued a Certificate stating that the FEIR adequately and properly complies with the Massachusetts Environmental Policy Act and with its implementing regulations.

The Permittee submitted a Notice of Project Change (NPC) to expand the list of acceptable materials that could be landfilled. The NPC was noticed in the Environmental Monitor on July 8, 2003. On August 7, 2003, the Secretary of Energy and Environmental Affairs issued a Certificate stating that the NPC did not require the submission of an Environmental Impact Report (EIR).

The Permittee submitted a second NPC requesting an increase in capacity to accommodate material diverted from SEMASS' Rochester waste-to energy facility, which had been damaged by fire. The second NPC was noticed in the Environmental Monitor on April 25, 2007. On May 25, 2007, the Secretary of Energy and Environmental Affairs issued a Certificate stating that the second NPC did not require the submission of an EIR.

The Permittee submitted a third NPC for the operation of the LFG electric generating facility. The third NPC was noticed in the Environmental Monitor on December 24, 2008. On January 23, 2009, the Secretary of Energy and Environmental Affairs issued a Certificate stating that the third NPC did not require the submission of an EIR.

7. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Enclosed is a stamped approved copy of the application submittal.

Should you have any questions concerning this Plan Approval, please contact the undersigned by telephone at 508-946-2824, or in writing at the letterhead address.

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Thomas Cushing, Chief
Permit Section
Bureau of Waste Prevention

Enclosure

cc: Bourne Board of Health
Bourne Fire Department
Tetra Tech – G. Lipka
USEPA, Region 1 - S. Lancey
D. Dahl
MassDEP/Boston - M. Wolman
Y. Tian
MassDEP/SERO – P. Weinberg, Regional Director
M. Pinaud, Deputy Regional Director, BWP
M. Dakers, Section Chief, Solid Waste
M. Poudrier
C. Tilden
L. Black